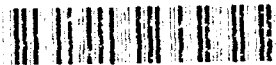
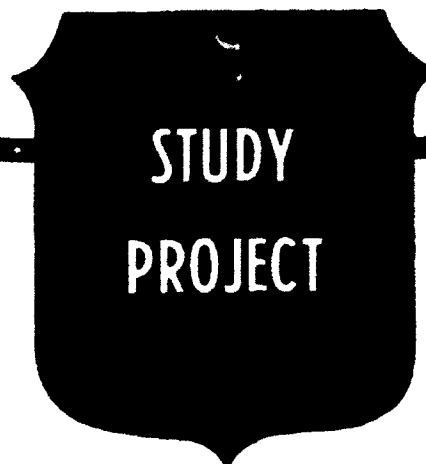


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## NUCLEAR NONPROLIFERATION, CONTROLS AND U.S. POLICY

BY

LIEUTENANT COLONEL ROLAND E. SASSER, JR.  
United States Army

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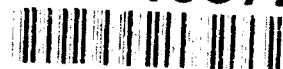
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The world has lived under a nuclear threat since the US used nuclear weapons in World War II. After the war, superpowers evolved that provided nuclear umbrellas to their alliances. The recent decline and breakup of the USSR was hailed by many as the notice that nuclear weapons could be greatly reduced and that the entire world would be a safer place. What has evolved, unfortunately, is a still dangerous and complex world where nations are scrambling for sovereignty, power and status with continued emphasis on nuclear weapons. The US is deeply involved in developing nonproliferation policy to encompass this new environment of a changed world structure and a new balance of power. This paper examines this problem in depth starting with the sheer magnitude of the problem and then delving into each of the more prominent nonproliferation controls measures. These measures are examined for advantages, disadvantages and applicability to US policy. The Iraq pursuit of nuclear weapons and the UN and US response and actions are examined as a case study to determine lessons learned for US policy. Finally, existing US policy is examined to allow suggestion of policy changes based on the paper research.

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NUCLEAR NONPROLIFERATION, CONTROLS AND US POLICY

AN INDIVIDUAL STUDY PROJECT

by

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## INTRODUCTION

Nuclear proliferation immediately brings to mind a world of chaos caused by a madman unleashing the terrible power of a nuclear weapon on innocent victims. Although this bleak scenario represents the world's worst fears, nuclear proliferation seems to be mostly fodder for academicians and doomsday predictors in the literary world. Relatively few Americans give the problem more than a passing thought. Difficult, complex and unwieldy in solution, nuclear proliferation demands the attention of the United States and the rest of the international community. The recent breakup of the Soviet Union and its potential spread of technology, scientists, materials and even weapons exacerbates nuclear proliferation problems. The much publicized case of Iraq's efforts to build nuclear weapons adds fuel to the belief that some smaller nations still see nuclear weapons as an instrument of power and will continue to pursue the goal of building a nuclear arsenal. Worldwide technology advances in nuclear research and its availability by computers and media capabilities, multiply rapidly the number of nations who can exploit this information. It is a problem that will not simply go away.

This paper will first outline the magnitude of the problem. Then it will introduce the major international nuclear nonproliferation controls in use and discuss the adequacy of those controls. Iraq, the first proven case of a signatory member's violation of the Nuclear Non-Proliferation Treaty (NPT), will be examined in some detail to determine how and why those

violations occurred and what those violations mean to the future nuclear nonproliferation efforts of the international community. US National Security Policy and US National Military Policy on nuclear nonproliferation will then be highlighted to show where current US resolve is focused. Conclusions will be drawn on adequacy and shortcomings of nonproliferation controls, the lessons of Iraq's NPT violations and stated US strategy and policy. Using the analysis and conclusions as a foundation, recommendations will be made for future US strategy and policy on nuclear nonproliferation controls.

#### MAGNITUDE OF THE PROBLEM

Nuclear proliferation threat is best shown by looking at three related areas. First is the current international levels of nuclear weapons available in the nuclear capable nations. The supporting delivery means (missiles) programs of developing nations is the second area. The third area is developing nations involved in nuclear weapons programs. Figures One, Two, and Three point out the incredible number of nuclear weapons in existence today, the developing countries with ballistic missiles and the number of countries now involved in proliferation that have evolved since the US introduction of nuclear weapons. Given the proliferation risk shown for the future by this information, the need for strong international nonproliferation control measures is clearly a matter of grave concern for all nations.

---

NUMBERS OF NUCLEAR WEAPONS

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	USA		USSR		UK		FRANCE		CHINA	
<u>YEAR</u>	<u>L</u>	<u>W</u>	<u>L</u>	<u>W</u>	<u>L</u>	<u>W</u>	<u>L</u>	<u>W</u>	<u>L</u>	<u>W</u>
1985	1965	11,974	2538	10,012	64	96	142	122	331	336
1986	1957	12,386	2506	10,108	64	96	138	218	320	325
1987	2001	13,002	2535	10,442	64	96	138	298	309	319
1988	1926	13,000	2553	10,834	64	96	132	292	313	323
1989	1903	12,100	2448	11,320	64	96	132	372	302	317
1990	1876	11,966	2354	10,880	64	96	132	452	304	324
1991	1239	8772	1857	9537	64	96	116	436	304	324

---

L = LAUNCHERS, W = WARHEADS

FIGURE ONE: KNOWN NUCLEAR WEAPONS ARSENALS OF THE USA, THE USSR, THE UK, FRANCE AND CHINA FOR 1985 - 1991

SOURCE: Robert S. Norris and William M. Arkin, "Nuclear Weapons Developments and Unilateral Reduction Initiatives," Stockholm International Peace Research Institute Yearbook 1992 (Stockholm: Oxford University Press, 1992), 82.

Country	System	Range / Payload	Type	Source	Status
Afghanistan	Scud-B	300 km / 1,000 kg	BM	Soviet Union	O/U
Algeria	Frog-4 Frog-7	50 km / 250 kg 65 km / 450 kg	BM BM	Soviet Union Soviet Union	R O
Argentina	Alacran Condor I Condor II	200 km / 500 kg 95 km / 365 kg 900 km / 450 kg	SLV/BM BM/SR BM	Consortium Consortium Consortium	D O(?) C
Brazil	MB/EE-150 SS-300 MB/EE-350 MB/EE-600 MB/EE-1000 SS-1000 IRBM Sonda 3 Sonda 4 VLS	150 km / 500 kg 300 km / 990 kg 350 km / N.A. 600 km / N.A. 1,000 km / N.A. 1,200 km / N.A. 3,000 km / N.A. 80 km / 135 kg 950 km / 500 kg 10,000 km / 500 kg	BM BM BM BM BM BM BM SR SR SLV	Brazil Brazil Brazil Brazil Brazil Brazil Brazil Brazil/Ger./Fr. Brazil/Ger. Brazil	D D/T D D D D P O D P/D
Cuba	Frog-4 Frog-7	50 km / 250 kg 65 km / 450 kg	BM BM	Soviet Union Soviet Union	R O
Egypt	Frog-5 Frog-7 Scud-B Scud-100	50 km / 450 kg 65 km / 450 kg 300 km / 1,000 kg 600 km / 500 kg	BM BM BM BM	Soviet Union Soviet Union Soviet Union N.Korea/Egypt	R O/U O/U D
India	Prithvi Agni Centaure Rohini SLV-3 ASLV PSLV GSLV	250 km / 500 kg 2,500 km / 900 kg 50 km / N.A. 130 km / N.A. 800 km / 100 kg 4,000 km / 150 kg 8,000 km / 1,000 kg 14,000 km / 2,500 kg	BM BM SR SR SLV SLV SLV SLV	India India India/U.S./Fr. India/France India/(?) India/Fr./Ger. India India	T/D T/D O O O D/T D/T P
Indonesia	RX-250 SLV (?)	100 km / N.A. 1,500 km / N.A.	SR SLV	Indonesia/Fr. Indonesia/(?)	D P

FIGURE TWO: DEVELOPING NATION MISSILE PROGRAMS

SOURCE: Jon B. Wolfsthal, "The Proliferation of Ballistic Missiles," Arms Control Today, (April 1992) 28, 29.

Country	System	Range/Payload	Type	Source	Status
Iran	Shahin-2	60 km / 180 kg	BM	Iran	O/U
	Nazeat	120 km / 180 kg	BM	Iran/China	O/U
	Mushak-160	160 km / N.A.	BM	Iran/China	O/U(?)
	Iran-200	200 km / N.A.	BM	Iran/China	O/U(?)
	Scud-B	300 km / 1,000 kg	BM	China/N.Korea	O/U
	Scud-C	600 km / 700 kg	BM	North Korea	O
Iraq*	Frog 7	65 km / 450 kg	BM	Soviet Union	O/U
	Laith	90 km / N.A.	BM	Soviet Union	D/T
	Nissan	110 km / N.A.	BM	Iraq	D
Israel	Lance	130 km / 275 kg	BM	United States	O
	Jericho I	650 km / 500 kg	BM	Israel/France	O
	Jericho II	1,500 km / 650 kg	BM	Israel/France	T/O
	Jericho IIb	1,300 km / ~700 kg	BM	Israel	T/O(?)
	Shavit	2,500 km / 750 kg	SLV	Israel/France	O/U
North Korea	Frog-5	50 km / 450 kg	BM	Soviet Union	O
	Frog-7	65 km / 450 kg	BM	Soviet Union	O
	Scud-B	340 km / 1,000 kg	BM	S.U./N.Korea	O
	Scud-C	600 km / 700 kg	BM	N.Korea/China	T/O
	No-Dong 1	1,000 km / N.A.	BM	N.Korea/China	D
South Korea	Nike-SSM	180 km / 500 kg	BM	U.S./S.Korea	O
	Korean-SSM	260 km / N.A.	BM	U.S./S.Korea	D
	Honest John	37 km / 580 kg	BM	United States	O
	SLV	4,000 km / N.A.	SLV	South Korea	P
Kuwait	Frog-7	65 km / 450 kg	BM	Soviet Union	R
Libya	Frog-7	65 km / 450 kg	BM	Soviet Union	O
	SS-21 (?)	120 km / 450 kg	BM	Soviet Union	O
	Scud-B	300 km / 1,000 kg	BM	Soviet Union	O/U
	Otrag	480 km / N.A.	BM	Libya/Ger.	D/C(?)
	Al-Fateh	500 km / N.A.	BM	Libya/Ger.	D
	Ittisalt	700 km / N.A.	BM	Libya/Ger.	D
Pakistan	Haft-I	80 km / 500 kg	BM	Pak./Fr./China	O
	M-11	290 km / 800 kg	BM	China	O(?)
	Haft-II	300 km / 500 kg	BM	Pak./Fr./China	T/D
	Haft-III	600 km / N.A.	BM	Pak./China	D/T(?)
	Shahpar	120 km / N.A.	SR	Pak./Fr./U.S.	O
	Suparco	280 km / N.A.	SR	Pak./Fr.(?)	O
	SLV	1,200 km / N.A.	SLV	Pakistan	P
Saudi Arabia	CSS-2	2,000 km / 2,000 kg	BM	China	O
South Africa	Armiston	1,500 km / N.A.	BM	S.Africa/Israel	T/D
	Jericho II	1,450 km / N.A.	BM	Israel	T
Syria	Frog-7	65 km / 450 kg	BM	Soviet Union	O/U
	SS-21	120 km / 450 kg	BM	Soviet Union	O
	Scud-B	300 km / 1,000 kg	BM	Soviet Union	O
	Scud-C	600 km / 700 kg	BM	North Korea	O(?)
Taiwan	Honest John	37 km / 580 kg	BM	United States	O
	Ching Feng	100 km / 275 kg	BM	Taiwan/Israel	O
	Tien Ma	950 km / N.A.	BM	Taiwan	C(?)
Turkey	Honest John	37 km / 580 kg	BM	United States	O
Yemen	Frog-7	70 km / 450 kg	BM	Soviet Union	O
	SS-21	120 km / 450 kg	BM	Soviet Union	O
	Scud-B	300 km / 1,000 kg	BM	Soviet Union	O

Sources: ACA, ACDA, CIA, CEIP, CRS, CSIS, DoD, IDDS, IDR, IISS, JDW, JSIR, and RUSI

## KEY

BM-Ballistic missile  
C-Cancelled  
D-In development

O-Operational  
P-Planned  
R-Removed from service

SR-Sounding rocket  
SLV-Space launch vehicle  
T-Tested

U-Used in attacks

---

NUCLEAR WEAPONS PROGRAM STATUS

---

SEEKING NUCLEAR WEAPONS

DEVELOPED PROGRAM

MIDDLE EAST

EGYPT	X	
IRAN	X	
IRAQ	X	
ISRAEL		X
LIBYA	X	

SOUTH AND EAST ASIA

CHINA		X
INDIA		X
NORTH KOREA	X	
PAKISTAN	X	
TAIWAN	X	

OTHER REGIONS

ARGENTINA	X
BRAZIL	X
SOUTH AFRICA	X

---

FIGURE THREE: DEVELOPING NATION NUCLEAR PROGRAMS

SOURCE: Leonard S. Spector, "Nuclear Proliferation in the 1990s," New Threats: Responding to the Proliferation of Nuclear, Chemical, and Delivery Capabilities in the Third World (Lanham, Maryland: University Press of America, 1990), 35-59.

## INTERNATIONAL NUCLEAR NONPROLIFERATION CONTROL MEASURES

Nuclear nonproliferation controls are described in various ways, but it is useful to have terms of reference used by the majority of the nonproliferation community to discuss them.. Most discussions on the subject center on the terms supply side controls or demand side controls. Supply side controls are those which put the emphasis on the suppliers to limit the availability of nuclear weapons materials or technology. Four supply side controls are discussed in this paper. The first is nuclear export controls which are applicable to nuclear weapon materials or nuclear weapon-use technology a nuclear weapon capable country might provide. The second is the Nuclear Supplier's Group (NSG), which is a formal organization of countries that has agreed to specific rules in export controls. The third is an indirect control called the Missile Technology Control Regime (MTCR) which is a formal organization of countries that tries to limit the potential delivery means for nuclear weapons (plus chemical, biological and conventional explosives). The fourth control is the test ban which is an agreement by nuclear weapon capable countries that states further nuclear explosion testing will be limited or not conducted (This also is an indirect approach with the idea that diminished or discontinued testing discourages further development and use of nuclear weapons.).

The demand side controls place the emphasis on the countries that do not have nuclear weapons to police themselves and keep their countries free of nuclear weapons. Some scholars of

nuclear nonproliferation call the NPT a demand side and supply side control because of its requirements on both parties. Its categorization is only important to the purist, and NPT will be discussed here under the heading of demand side controls. The NPT is a treaty between nuclear weapons capable countries and nuclear weapons non-capable countries (referred to in the treaty, and hereafter in this paper, as nuclear weapon states and non-nuclear weapon states) that calls for limiting nuclear weapons to countries that had exploded a nuclear device before 1967. A second demand side control is the nuclear-weapons-free-zone treaty, which bans weapons ownership and use in a specific regional area. Two such treaties, the Treaty of Tlatelolco and the Treaty of Rarotonga will be discussed.

Another control, the International Atomic Energy Agency (IAEA) fits in neither side of controls, but it is the single most recognized agency of control and verification. The NPT uses IAEA as its executive agent for treaty compliance. A detailed discussion with analysis of problem areas follows on supply side controls, demand side controls and the IAEA.

Nuclear export controls assume the supply side reasoning in nuclear nonproliferation. Supply side advocates believe that nonproliferation can be accomplished by the nuclear capable states not allowing the transfer of nuclear weapons, materials and technology to those countries that do not have a nuclear capability. This assumes that nuclear weapon states can create commerce and export controls within their own borders that will

stop the flow of nuclear items. The policy can adequately stop major items such as weapons and larger identifiable pieces, but unfortunately there are numerous dual-use nuclear components that are also compatible with common industry machinery. Trying to identify and prevent all nuclear related items from being exported is almost an impossible task. Most any devious nation could spread the procurement of components around enough to various suppliers to easily hide the end purpose. Iraq and Libya both are regrettable proof that export controls can be overcome.

However hard to execute, export controls are still required to keep proliferation from becoming commonplace or at least keeping the honest nations honest. Perhaps even more difficult to control is technology transfer. In a democratic society a wealth of materials is readily available and quickly assembled with the use of computers. What has required years of research and innovative thinking in the nuclear community, has now been almost reduced to blueprints with standard operating procedures that can be followed by many engineers with reasonable nuclear training. The saving grace for the rest of the world is the enormous expense involved in actually producing the materials and a suitable delivery means. Although this may be a somewhat dramatized simplification, it does point to the difficulty the world faces in attempting to control nuclear technology transfer.

Nuclear export controls have other weaknesses that make them only partially successful. First, they may be looked upon by other countries as a 'have' and 'have not' policy. Non-nuclear

states may see the controls as trying to keep them below the exporting nation's level of sophistication in nuclear capability when the non-nuclear states need it for economic purposes.

Second, ensuring export controls work at the level of customs transfer is extremely difficult in execution. Identification is usually by numbers and item nomenclature. Custom officials with insufficient nuclear component identification background can be and are often misled in end use of components.

The Nuclear Supplier's Group (NSG), sometimes called the London Supplier's Group, is another supply side export control aimed at reducing available nuclear weapon-use materials. The group started its meetings in London and initially consisted of Canada, France, West Germany, Japan, the United Kingdom, the United States, and the United Soviet Socialist Republic. These countries exchanged letters of agreement on export guidelines. This arrangement was unfortunately not a treaty. It was only an agreement and that limited its ability to be enforced.<sup>1</sup> Although formed in 1975, the group had not formally reconvened for over fifteen years, but did reconvene on 3 April 1992. By this time, the NSG had grown to over twenty seven nation members. Iraqi abuses were the catalyst for reconvening the body. The twenty seven nation members concentrated their efforts on developing guidelines for nuclear items that could be considered dual-use and eventually agreed to a new listing of dual-use items.<sup>2</sup> The NSG suffers the same problems at customs level as other export controls, but NSG is working as an organized effort at an

international level. The international cooperation of members of NSG helps to focus world attention and will likely have a positive effect in long term nuclear nonproliferation.

The effort to control the proliferation of missiles as a delivery means for a nuclear weapon is an indirect supply side control. The most prominent effort to do this is the Missile Technology Control Regime (MTCR). Established in 1987, the MTCR is a pact among signatory nations restricting the transfer of ballistic missiles carrying 500 or more kilogram payloads at ranges of 300 plus kilometers. The MTCR has eighteen formal members, and non-members Israel and China have pledged to abide by the rules of the MTCR. Russia has also announced its intentions of joining. Other suppliers not yet complying with guidelines are Argentina, Brazil, South Africa, India, North Korea, and Pakistan.<sup>3</sup>

As noted by Figure Two, the potential for nuclear delivery devices is widespread. Fortunately, the weaponization of a nuclear warhead is considerably harder than conventional warhead arming. The greater threat may be that some non-nuclear states may try to obtain even a tactical nuclear weapon from the disintegrated USSR or even China and attempt to use it on the missiles readily available in almost every region of the world. That concern alone is worth the effort being applied to the MTCR. The MTCR was credited with helping stop the Argentinean - Egyptian - Iraqi Condor II program in 1990, slowing Chinese M-9 sales, and slowing West German missile technology sales to Libya

and Iraq.<sup>4</sup> Although MTCR is an indirect control, it and the other measures being applied together continue to build a solid front for nuclear nonproliferation.

Another indirect control contributing to nuclear nonproliferation is the application of test bans. Test bans keep nuclear weapon states and developing nuclear nations from refining weapons or weapons technology. The 1963 Limited Test Ban Treaty (LTBT) prohibited atmospheric nuclear tests but allowed underground tests. The LTBT had 116 signatory members and achieved admirable results in limiting atmospheric nuclear tests, but underground nuclear tests continued unabated as Figure Four shows.<sup>5</sup> The US has conducted forty five percent of all known nuclear tests since 1945 and conducted more tests in 1990-1992 than the rest of the world combined.

In 1991 after many test ban efforts from 1963 forward, a body of nations formally met to propose a Comprehensive Test Ban. President Bush signed the legislation for the US that banned nuclear tests after 30 September 1996, unless a foreign state tests after that date, and put into effect a moratorium on testing until 1 July 1993. No more than fifteen tests may be conducted from 1993 to 1996. The other major tester, the former Soviet Union, agreed to the moratorium as well. All other nuclear weapon states agreed to the ban if the US and Russia led the way.<sup>6</sup> The testing of nuclear weapons is a verifiable ban based on space satellite intelligence, seismographic and other National Technical Means (NTM). Thus far this intelligence has

Year	United States	USSR/Russia	Britain	France	China	Total	Year	United States	USSR/Russia	Britain	France	China	Total
1945	3	0	0	0	0	3	1970	35	17	0	8	1	61
1946	2	0	0	0	0	2	1971	17	19	0	6	1	43
1947	0	0	0	0	0	0	1972	18	22	0	3	2	45
1948	3	0	0	0	0	3	1973	16	14	0	5	1	36
1949	0	1	0	0	0	1	1974	14	18	1	8	1	42
1950	0	0	0	0	0	0	1975	20	15	0	2	1	38
1951	16	2	0	0	0	18	1976	18	17	1	4	4	44
1952	10	0	1	0	0	11	1977	19	18	0	6	1	44
1953	11	4	2	0	0	17	1978	17	27	2	8	3	57
1954	6	7	0	0	0	13	1979	15	29	1	9	1	55
1955	18	5	0	0	0	23	1980	14	21	3	13	1	52
1956	18	9	6	0	0	33	1981	16	22	1	12	0	51
1957	32	15	7	0	0	54	1982	18	32	1	6	1	58
1958	77	29	5	0	0	111	1983	17	27	1	9	2	56
1959	0	0	0	0	0	0	1984	17	29	2	8	2	58
1960	0	0	0	3	0	3	1985	17	9	1	8	0	35
1961	10	50	0	2	0	62	1986	14	0	1	8	0	23
1962	96	44	2	1	0	143	1987	14	23	1	8	1	47
1963	44	0	0	3	0	47	1988	14	17	0	8	1	40
1964	38	6	1	3	1	49	1989	11	7	1	8	0	27
1965	36	10	1	4	1	52	1990	8	1	1	6	2	18
1966	43	15	0	7	3	68	1991	7	0	1	6	0	14
1967	34	17	0	3	2	56	1992	6	0	0	0	2	8
1968	45	15	0	5	1	66	Total	942	715	44	192	38	1,932
1969	38	16	0	0	2	56							

FIGURE 4: NUCLEAR WEAPONS TESTS, 1945-1992

SOURCE: DUNBAR LOCKWOOD, "WORLD NUCLEAR TESTING 1945-1992,"  
ARMS CONTROL TODAY (NOVEMBER): 37

been very reliable, and it is likely to prevent future abuses.

The most recognized nuclear nonproliferation control is the Non-Proliferation of Nuclear Weapons Treaty (NPT). Signed on 1 July 1968 and entered into force on 5 March 1970, the NPT declared the "intention to achieve at the earliest possible date the cessation of the nuclear arms race and to undertake effective measures in the direction of nuclear disarmament."<sup>7</sup> This treaty was probably an outgrowth of the earlier success of a 1963 treaty to ban atmospheric nuclear weapons tests. The NPT's basic tenet was to preclude weapons, components and weapons-use materials from directly or indirectly being spread to new nations. The treaty defined a nuclear weapon state as one that had exploded a nuclear weapon or other nuclear explosive devices before 1 January 1967. NPT nuclear weapon signatory states agreed to prevent the spread of nuclear weapons and non-nuclear weapon signatory states agreed not to seek them. Non-nuclear weapon states agreed to safeguards enforced by the inspections of the International Atomic Energy Agency (IAEA) which was given verification oversight under the treaty articles. Peaceful research, production and use of nuclear energy were considered given rights of any signatory nation. Little discussed in most articles about NPT, but one of its major selling points to non-nuclear states, was the treaty requirement for nuclear weapon states to share potential benefits of nuclear testing and research. The Treaty called for conferences every five years for review and changes, and at twenty five years (1995), a review for

permanency or extension. The United States, the Union of Soviet Socialist Republics and the United Kingdom were assigned as the depository governments.<sup>8</sup> Depository governments are the caretakers of documentation efforts and generally the catalyst governments for membership meetings and treaty efforts.

NPT is perhaps the most successful of the nuclear nonproliferation controls, mainly because it is internationally recognized and not merely bilateral in support of only the US and the former Soviet Union. Multilateral support and assistance are key in trying to convince less developed non-nuclear weapon states to join and comply with the Treaty. Hans Blix, director of IAEA, stated in August 1992 that there are currently 146 member nations.<sup>9</sup> Notably absent and troublesome to the goals of the NPT are the countries of Israel, India, Pakistan, Argentina, Brazil and France.

If the NPT is seen as more supportive or biased to the 'haves' versus the 'have nots', its power and support will rapidly diminish. Accordingly, NPT efforts to monitor and inspect treaty members require a delicate touch in execution. That very stipulation becomes its weakness. The best role for NPT would be to have unannounced inspections done by the IAEA on countries suspected of noncompliance and then to mete out stiff penalties for abusers. If an abuser was a small non-nuclear weapon state signatory to the NPT, other small non-nuclear weapon states would be the first to claim biased inspections influenced by the nuclear weapon states. Another significant problem with

NPT is its inability to enforce any punitive action for abuses. In the past, there has been little international agreement on what the punitive actions should be or how to enforce punishment. The most recent verified abuses and resulting UN actions in Iraq have been a step forward in developing solutions in this area.

Nuclear-weapons-free-zone is another treaty related demand side control of nuclear nonproliferation. This type of treaty bases its agreements on nations mutually agreeing not to acquire, test or use nuclear weapons in a specific regional area. Two major nuclear-weapons-free-zone treaties exist now, one in Latin America and the second in the islands of the South Pacific Ocean near Australia.

The first agreement on a nuclear-weapons-free-zone was entered into force in April 1969 and called the Treaty of Tlatelolco. This treaty prohibited "...the testing, use, manufacture, production or acquisition by any means, as well as the receipt, storage, installation, deployment and any form of possession of any nuclear weapons in Latin American countries."<sup>10</sup> The treaty called for each signatory member to agree to IAEA safeguards on their peaceful nuclear activities. Two later protocols to the treaty added agreements for territories of the Netherlands, the United Kingdom (UK) and the United States (US) to respect the non-use and testing of weapons in the area. The nuclear weapons states further agreed not to use nuclear weapons against any of the treaty signatory members in the treaty geographic area.<sup>11</sup> As of 1 January 1992, the treaty had 23

members<sup>12</sup>.

The second treaty, called the Treaty of Rarotonga was essentially the same type of agreement. Three protocols have been added to this treaty which obtained agreements from the UK, the US and France for precluding nuclear weapons or testing in their territories. Under protocols two and three, China, France, the UK, the USA and the USSR agreed not to use nuclear weapons against any of the treaty members and not to test nuclear weapons anywhere inside the treaty geographic area.<sup>13</sup> As of 1 January 1992 this treaty had 11 members.<sup>14</sup>

Thus far both of these treaties have held together, but France has caused some strain because of its desire to test in the Rarotonga Treaty area. The concept has proven to build trust in its members' mutual goals. The US has not only been agreeable to the protocols, but has also provided assistance in peaceful nuclear pursuits in the area. The US national strategy goals support these regional nuclear-weapons-free-zone treaties and the US is encouraging other regions to pursue such treaties. From the US standpoint, regional treaties are cumbersome to the State Department to orchestrate US involvement, but each of these treaties does support the overall goal of nuclear nonproliferation.

Although a subset of NPT controls, the IAEA safeguards system is a control in itself. IAEA is the critical link to NPT being an effective international instrument of nuclear nonproliferation. IAEA was formed on 29 July 1957 as an

outgrowth of the world's concern over nuclear weapons and as a focal point for peaceful use of nuclear energy. President Eisenhower's "Atoms for Peace" speech in 1953 served as the catalyst for the agency formulation, but world politics delayed its actual formulation almost four years. Initially the Soviets tried to use it as a forum for disarmament, but eventually they gave into its purpose as a forum for peaceful nuclear energy use.<sup>15</sup>

The IAEA had a Department of Safeguards from the beginning of its existence, but the role has grown immensely compared to the IAEA's other departments. From a beginning staff of seven in 1960, the staff has grown to 455 in 1987.<sup>16</sup> The Department of Safeguards now consumes more than a third of the IAEA's budget.<sup>17</sup>

IAEA's importance to nuclear nonproliferation did not just come about with the advent of the NPT, but certainly the new role as the world's leading agency of verification was clearly focused after the ratification of NPT in 1970. Although often thought of as a United Nations (UN) activity, the IAEA is not a specialized agency of the UN; and it acts independently of the UN. In fact, it has its own statute and board of governors.<sup>18</sup> Taking on the role of international verifications and safeguarding for NPT fits closely Article II of the IAEA to "ensure, so far as it able, that assistance provided by or at its request or under its supervision or control is not used in such a way as to further any military purpose."<sup>19</sup> The agency accepted and welcomed the

role for NPT since it saw the opportunity to promote its own agency goals.

The IAEA's role in NPT evolved from Article III of the NPT that states "Each non-nuclear-weapon State Party to the Treaty undertakes to accept the safeguards, as set forth in an agreement to be negotiated and concluded with the International Atomic Energy Agency and the Agency's safeguards system..."<sup>20</sup> General IAEA safeguards of verification are materials accountability, containment, (restricting access to and preventing clandestine movement of nuclear materials), surveillance and on-site inspections.<sup>21</sup> This sounds simple enough, but volumes of guidance, interpretation and arguments have been written by IAEA members, NPT members and advocates and detractors of nuclear nonproliferation controls. Currently, using mostly on-site inspections, IAEA verifies use of nuclear materials at 900 facilities in over 50 countries.<sup>22</sup> Probably no one agency performs a more important role in worldwide nuclear nonproliferation than does IAEA.

Until the defeat of Iraq in Desert Storm, the IAEA performed its role in a rather low key manner not attracting much attention. Its inspections were scheduled, routine and unobtrusive to the country being inspected. When the world focused on the Gulf War and its resulting search for Iraq's "smoking nuclear gun", the IAEA became well known and an international tool of justice. The United Nations Security Council Resolution 687 gave the IAEA new powers for inspection in

Iraq. A detailed look at the results and the still ongoing story of Iraq's violations of IAEA safeguards and the NPT itself presents the strongest arguments yet for the need for nonproliferation controls as well as controls improvements.

#### IRAQ'S NPT AND IAEA SAFEGUARDS VIOLATIONS

US and Israeli intelligence sources had long suspected Iraq was trying to build a nuclear weapons arsenal. Before the Gulf War, President Bush warned "Those who would measure the timetable for Sadaam's atomic program in years may be seriously underestimating...the gravity of the threat."<sup>23</sup> How long it would have taken for Iraq to build a nuclear weapon is still speculative even with all that is known from the on-site inspections. It is now known, by the admission of its own disclosure documents to the UN, that Iraq was on the path to building nuclear weapons and had code named the project "Petrochemical Three (PC-3)".<sup>24</sup>

The complete history behind Iraq's efforts to build nuclear weapons may never be known, but pieces of it can now be constructed from IAEA and United Nations Special Commission (UNSCOM) inspections. These two inspection teams have gathered extensive facts and documentation in over fifty team inspections in Iraq since 15 May 91. The teams have sifted through sites and documents as well as participating in the actual destruction of materials and facilities. A chronology of events tells the story of deceit and treachery. The timing of events and how it unfolds

is important in helping to gain insights for lessons learned to use in future nonproliferation efforts.

In May 1991, IAEA and the UNSCOM were given the task of conducting on-site inspections in Iraq and taking possession of the weapons of mass destruction. The UNSCOM was also empowered to conduct challenge inspections. A challenge inspection was done when intelligence, provided mostly by the US, suggested an untrue or incomplete claim by Iraq. These inspections could be done anywhere deemed necessary by the inspection team. Chemical, biological and nuclear inspections were to be done as well as inspections on destruction of ballistic missiles with a range over 150 kilometers. The missiles were to be destroyed by Iraq itself, but under the supervision of the inspection teams.<sup>25</sup> The team's first inspection completed on 23 May 1991 verified only the safeguarded materials under previous disclosure to IAEA. IAEA found no violations during this inspection.<sup>26</sup>

This was an important issue at this point. Until this time, the IAEA had believed that Iraq was complying with NPT and IAEA requirements. Finding nothing unusual confirmed UN and IAEA beliefs, even though the US was stating publicly they believed Iraq was violating the NPT. The US had attacked several facilities because it believed the facilities were being used in production of nuclear materials for nuclear weapons, clearly in violation of the NPT. This point, although moot now, may have implications in any future suspected violations of NPT. Intelligence information from the US will be hard for the UN or

IAEA to ignore with any new potential violators.

In June and July 1991, based on US intelligence, two challenge inspections were done in the city of Al-Tarmiya and in Abu-Gharaib. The teams were detained or denied access to the areas while suspected nuclear materials were visibly removed.<sup>27</sup> This was to be the first of a pattern of hide and seek games that the Iraqis would play with the IAEA and UNSCOM inspection teams. The US continued to feed satellite and U2 reconnaissance aircraft intelligence to the inspectors.

On 3 June 1991, a nuclear Engineer, who had been pressed into service when he returned to Iraq from abroad, had escaped and defected to US military forces. The engineer claimed Iraq was hiding much more and that US bombs had missed several facilities that were involved in the nuclear program. Until this point, the US believed it had destroyed most of Iraq's nuclear capability. Now they were not so sure.<sup>28</sup> The hunt for hard evidence definitely intensified at this point.

On 7 July, Iraq sent a letter to the UN admitting it had been pursuing uranium enrichment by more than one method. At this juncture, there had been three inspection teams in Iraq. Using the Iraqi letter and gathered information, the teams pieced together that Iraq had tried three methods of uranium enrichment: electromagnetic separation, centrifuge enrichment, and chemical separation.<sup>29</sup>

This was the outright proof that Iraq had flagrantly violated the NPT. Even more important, this was the eye-opening

proof that export controls on nuclear weapons use materials and technology were sorely lacking. It also proved to US analysts that verification using national technical means (NTM) such as satellites and U2 reconnaissance aircraft photographs did not always tell all the story.

By October 1991, seven inspection teams had been into Iraq and most had been harassed or at least had access problems as Iraq became openly defiant. The UN teams were accumulating numerous documents that slowly pieced together the overall nuclear program. Adding concern to what was already known was the discovery of documents that linked a delivery means to the weapons program. Iraq was exploring the use of a missile called Condor II that was built originally by Argentina. The Iraq version was the twin Badr-2000 missile.<sup>30</sup>

By this time, the inspections were becoming extremely intrusive and Iraq was becoming less and less cooperative. Based on disturbing revelations on Iraq's violations of the NPT and its continued non-cooperation with UN and IAEA teams, the UN enacted a plan barring Iraq from engaging in even a peaceful nuclear program. Only after nuclear weapon materials and facilities have been eliminated by IAEA, may Iraq embark on peaceful nuclear programs, and then only with IAEA approval.<sup>31</sup> Again, this move by the UN is significant in that it set a precedent for future violators of the NPT. However, this would likely be difficult to enforce in a peaceful disregard of NPT as opposed to a wartime action by the UN, as in the Iraq case.

By December 1991, The IAEA had obtained a partial list of nuclear materials suppliers. On 12 December 1991, the IAEA released a list of suppliers that included Dupont, in the US; eight German companies; two Swedish companies; and one Japanese company. The IAEA did stress that these manufacturers' products may have been indirectly supplied to Iraq. Some of the items were also considered dual-use and therefore not export controlled at the time.<sup>32</sup>

The significance of this action was apparent to the entire industrialized world. Nuclear weapons materials suppliers would be publicly rebuked and scrutinized. When export controls and sanctions were violated, some prosecutions could be carried out as done so in Germany. This also highlighted the problems of dual-use items not under export control and the need to scrutinize the current controlled list for old nuclear technology items that might be used in programs in countries trying to use past methods of uranium enrichment. Critical, but extremely difficult to solve, is the indirect shipment of items bought and redirected to potential NPT violators. Although most countries have a requirement for an end-user's license on sensitive exports, devious middle men regularly overcome the requirement.

In February 1992, the IAEA board of Governors met and approved a number of measures that would strengthen the IAEA's ability to uncover potential violators. These recommendations were based mostly on Iraq experience. The primary measure was the right of the IAEA to inspect "suspect sites" on short notice.

Although the original treaty had a phrase that stated the same principle, the IAEA had never conducted a single "suspect site" inspection since the NPT inception in 1970. Another new requirement adapted was for NPT signatories to provide IAEA with designs of nuclear installations as soon as the decision to begin construction is made. The board discussed using intelligence from members to determine "suspect site" inspections, but several members voiced concerns that the larger nations with large intelligence resources would dominate the smaller NPT countries.<sup>33</sup>

By June 1992, the IAEA aided by UNSCOM and Iraqi personnel, had destroyed key nuclear facilities at Al-Athee. However, sanctions continued as Iraq still refused to provide a complete list of nuclear suppliers. Along with nuclear materials destruction, 62 ballistic missiles were destroyed plus numerous chemical munitions. The following months saw more weapons destruction but continued antagonistic treatment of the inspection teams. The last team to date, the fifteenth IAEA team, set up a nationwide water testing system. This system will allow long term monitoring activities to detect any sizable nuclear activity within the country. Samples were taken from forty three locations throughout Iraq. The media has described this as a 'urinalysis' of sorts for Iraq. This urinalysis plus NTM intelligence should give a reasonably good indication of any further clandestine nuclear activities. The team also continued its search for SCUD missiles and the UNSCOM team received Iraq's

accounting for 819 missiles.<sup>34</sup>

The chronology of Iraq's dealings with the UNSCOM, the IAEA and UN in general shows a continued trail of intended deceit. However, the IAEA and UN did gain powerful lessons learned in dealing with future potential violators. IAEA also discovered a number of potential weaknesses in its rules, standards and methods of conducting inspections. The IAEA has come out of this a much stronger agency with a better budget to conduct business and clear international support. The NPT itself has gained in stature due to its resolve to enforce its rules. The UN has gained in creditability and multilaterally imposed sanctions have taken on a new meaning.

#### US STRATEGY AND POLICY ON NUCLEAR NON-PROLIFERATION

The US National Security Strategy, dated January 1993, states US nonproliferation policy is guided by four principles:

"Build on existing global norms against proliferation and, where possible, strengthen and broaden them.

Focus special efforts on those areas where the dangers of proliferation remain acute, notably the Middle East, Southwest Asia, South Asia, and the Korean Peninsula.

Seek the broadest possible multilateral support, while reserving the capability for unilateral action.

Address the underlying security concerns that motivate the acquisition of weapons of mass destruction, relying on the entire range of political, diplomatic, economic, intelligence, military, security assistance, and other available tools."<sup>35</sup>

The explanation of this passage within the National Security

Strategy document suggest strengthened export controls, and continued support for MTCR, NPT, IAEA, and nuclear-weapons-free-zone treaties. One new area added since 1992, is support for creating employment for former USSR nuclear scientists and engineers. One other important policy change is the "Arms Control and Disarmament Agency (ACDA) refocused to support nonproliferation in addition to its traditional agenda..."<sup>36</sup> All total, one page of twenty one pages in the document is devoted to nonproliferation. Other than these two initiatives, our US National Security Strategy and resulting policies converges with the international community controls.

US National Military Security Strategy devotes six lines in twenty seven pages to nuclear nonproliferation simply restating the National Security Strategy.<sup>37</sup> In defense of the military strategy, this task lies greatly in other US agency missions, but the implications of failure in nuclear nonproliferation lead to military concern and involvement.

How guidelines may shift with the new administration is not yet known. The newest National Security Strategy is still a product of the last administration. However some insight to the future can be gained from the comments of President Clinton to the journal Arms Control Today in March 1992. When asked for his comments on nuclear nonproliferation he stated:

"...We need to clamp down on countries and companies that sell these technologies, punish violators, and work urgently with all countries for tough, enforceable, international nonproliferation agreements.

...strengthen the International Atomic Energy Agency

safeguards...

...seek from Congress legislation that would bar imports of goods and services from those foreign companies that knowingly provide direct or indirect support for nuclear weapons programs of non-nuclear weapon states...

...seek much greater cooperation and support for the use of economic and related leverage in discouraging countries seeking to acquire nuclear weapons...

...coordinate a coherent international response that provides strong economic incentives to North Korea to abandon its nuclear weapons efforts and to open up its facilities for inspection, and severe economic penalties for failure to do so."<sup>38</sup>

Then candidate Clinton was either well briefed or very savvy on the problem areas of nuclear nonproliferation. He alluded to almost all the problems discussed in this paper and suggested some of the same conclusions and recommendations that nonproliferation experts have generally touted as solutions. The tough part comes now, to see if the comments were political rhetoric or if they will become a part of the new National Security Strategy produced by the new administration.

#### CONCLUSIONS

Nuclear nonproliferation controls are a noble idea but execution is difficult to enforce. The research for this paper has found nothing markedly new in ideas for nonproliferation controls, but it has found distinctive reinforcement for many of the existing concepts. The magnitude of problems, although still presenting a considerable threat to nuclear nonproliferation, is actually diminishing in size in some areas thanks to the myriad of controls being applied by the international community. Export

controls are definitely tougher and more specific toward dual-use items since the last meeting and agreements of the NSG. Iraq's intentional violations have heightened international awareness and willingness by most UN countries to prosecute violators. The cooperation among NSG members is creating an excellent data base of nuclear-use materials that can be used to scrutinize potential violators such as Iraq.

MTCR is meeting with success in getting the major suppliers to slow the missile proliferation, particularly to the volatile Middle East. The addition of the People's Republic of China (PRC) to this regime is a major breakthrough, if in fact the PRC lives up to its agreements. The MTCR involvement in stopping the Iraqi Condor II missile program probably saved lives during the Gulf War and certainly slowed its nuclear efforts for a weapons platform.

The test bans are accomplishing the intended purpose of slowing weapons development in the nuclear capable states. Open testing would probably have pushed India along much faster than it did proceed. The US and Russia agreements to the CTB led the way for all nuclear capable states to slow and will eventually stop testing.

The NPT has become the most recognized and significant of all nuclear nonproliferation controls. Troublesome nations have been receiving considerable pressure from the international community to join and abide by the NPT. The Gulf War strengthened the Treaty and the resolve of its members to believe

that sanctions are a powerful tool of compliance if mutually agreed to and universally applied.

The nuclear-weapons-free-zone treaties have also shown promise as an international tool of nuclear nonproliferation. Their individual area concept does require considerable state department involvement to administer each one, but the gains are worth the efforts.

IAEA may be the single most revitalized effort of nuclear nonproliferation. Iraq's continuous deceit requiring inspection teams to return repeatedly, proved to be an outstanding training exercise for what to look for, what procedures to use and what procedures needed updating. Standard procedures of inspecting only declared nuclear materials proved to be ineffective and missed nuclear materials and facilities engaged in illegal activities by NPT agreements. IAEA safeguards are the key to success of the NPT, but they have been weakly enforceable in the past by lack of international resolve to allow challenge inspections and to collectively punish violators. The lack of intelligence sources and NTM in past IAEA inspections has been a severe handicap in ferreting out illegal activities. The Iraq analysis also showed a porous export control list that helped concentrate the efforts of the NSG in the 1992 convention.

US National Security Strategy and supporting national military strategy do indeed cover the necessary areas of nuclear nonproliferation. However the emphasis for the NPT and IAEA is weak and test ban treaties are not even mentioned. The

'refocused' ACDA, in theory, should provide central synchronized leadership for a strong nonproliferation effort, if the new administration executes the program suggested.

#### RECOMMENDATIONS

The US must recognize nuclear nonproliferation is not just a US problem; it is an international community problem. As such the US should not unconsciously enforce our will on lesser nations that already see us as a bully in international politics. The US must become a cooperative player in the NPT and build trust throughout the member states. Nonproliferation controls being pursued by the US are the correct ones but should be applied fairly and consistently, not as the block bully or when the US is seeking economic gain. US National Security Strategy on nuclear nonproliferation controls should be concentrated under the control of the US State Department and ACDA. The ACDA should focus and synchronize all the different nuclear nonproliferation controls.

Clearly the centerpiece control for the US must be the NPT. Political support must be woven into our state department's strategy to convince all countries to join NPT. A sincere US offer to share nuclear technology for peaceful uses would likely increase NPT member trust and probably expand NPT membership. Our continued financial support is an important requirement to continue NPT as a viable organization and should be expanded to help build worldwide support for NPT.

The IAEA must be bolstered in statute by US support that includes provision of our best scientists and the highest level of intelligence available. In the 1995 NPT conference, heavy US political pressure should be applied on the UN and all NPT members to empower the IAEA to do unrestricted inspections and accept intelligence from NPT member nations. The US should make acceptance of unrestricted IAEA safeguards a condition of transfer of nuclear materials or technology to NPT members and all non-members. Last, US actions in NSG, nuclear-weapon-free-zone treaties and MTCR should continue to be part of our national security strategy on nonproliferation.

## ENDNOTES

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<sup>3</sup>Jon B. Wolfsthal, "The Proliferation of Ballistic Missiles," Arms Control Today, (April 1992): 28.

<sup>4</sup>James E. Nolan, "The Global Arms Market After the Gulf War: Prospects for Control," The Washington Quarterly, (Summer 1991): 125.

<sup>5</sup>Tina Rosenberg, "Nuking the Nukes," The New Republic, (28 Jan 91): 22.

<sup>6</sup>Dunbar Lockwood, "World Nuclear Testing 1945-1992," Arms Control Today, (November 1992): 37.

<sup>7</sup>United Nations, "Non-Proliferation of Nuclear Weapons Treaty," Treaty Series, Vol. 729, (1 July 1968).

<sup>8</sup>Ibid.

<sup>9</sup>Hans Blix, "Verification of Nuclear Nonproliferation: The Lesson of Iraq," The Washington Quarterly, (Autumn 1992): 63.

<sup>10</sup>Harald Muller and Richard Kokoski, The Non-Proliferation Treaty (Stockholm: AB Ingeniorskopia Solna, 1990), 77.

<sup>11</sup>Ibid, 77.

<sup>12</sup>Raghild Ferm, "Major Multilateral Arms Control Agreements," Stockholm International Peace Research Institute Yearbook 1992 (Stockholm: Oxford University Press, 1992), 598.

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<sup>15</sup>Lawrence Scheinman, The International Atomic Energy Agency and Nuclear World Order (Washington: Resources for the Future, 1987), 49-80.

<sup>16</sup>Ibid, 113.

<sup>17</sup> Ibid, 112.

<sup>18</sup> Ibid, 81

<sup>19</sup> Ibid, 125.

<sup>20</sup> Harald Muller and Richard Kokoski, The Non-Proliferation Treaty (Stockholm: Stockholm International Peace Research Institute, 1990), 73.

<sup>21</sup> Ibid, 3.

<sup>22</sup> Hans Blix, "Verification of Nuclear Nonproliferation: The Lessons of Iraq," The Washington Quarterly, (Autumn 1992): 57.

<sup>23</sup> Matthew Bunn, "A Persian Gulf War to Stop an Iraqi Bomb," Arms Control Today, (December 1990): 23.

<sup>24</sup> David Albright and Mark Hibbs, "Iraq's Quest for the Nuclear Grail: What Can We Learn?," Arms Control Today, (July/August 1992): 3.

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<sup>27</sup> Jon B. Wolfstahl, "Nonproliferation Roundup: Two steps Forward, One Step Back," Arms Control Today, (July/August 1991): 25.

<sup>28</sup> Ibid, 25.

<sup>29</sup> Jon B. Wolfsthal, "UN Teams Face Down Iraqi Resistance to Nuclear Inspections," Arms Control Today, (September 1991): 31.

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<sup>33</sup> Jon B. Wolfsthal, "IAEA to Implement 'Suspect Site' Inspection Powers," Arms Control Today, (March 1992): 27.

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<sup>35</sup>The White House, National Security Strategy of the United States, (Washington: U. S. Government Printing Office, 1993), 16.

<sup>36</sup>Ibid, 16.

<sup>37</sup>United States Department of Defense, National Military Strategy of the United States, (Washington: U. S. Government Printing Office, January 1992), 1.

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